DOCUMENT RESUME

ED 140 490 95 EA 009 665

AUTHOR Rossmiller, Richard A.; Geske, Terry G.
TITLE Resource Allocation and Time Utilization in IGE and Non-IGE Schools. Technical Paper No. 410.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Cognitive Learning.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Jan 77
CONTRACT NE-C-00-3-0065
NOTE 92p.; Report from the Project on Organization for Instruction and Administrative Arrangements; Tables and Appendixes A and B may not reproduce clearly due to small type size

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS Costs; Elementary Education; Expenditure Per Student; *Individualized Curriculum; Individualized Programs; Measurement Instruments; *Multiunit Schools; *Program Costs; Questionnaires; *Resource Allocations; Statistical Analysis; Tables (Data); Teachers; Teacher Salaries; *Time Factors (Learning)
IDENTIFIERS *Individually Guided Education

ABSTRACT

This study addressed two basic questions; (1) Do individually guided education (IGE) schools cost more or exhibit different expenditure patterns than non-IGE schools? (2) Do instructional personnel in IGE schools allocate their time differently than instructional personnel in non-IGE schools? Data were obtained from a random sample of 41 IGE schools and 15 pairs of matched IGE and non-IGE schools drawn from 13 states. Two instruments--the School Expenditure Data Form and the Time Allocation of Instructional Personnel form--were developed and used to collect data for the study. Descriptive data were presented for the sample of 41 IGE schools and t-tests for dependent samples were calculated to determine if the difference between the means were significant for any of the school expenditure and time allocation categories for the matched pairs. IGE schools did not cost more than non-IGE schools. IGE schools spend more for instructional supplies and other supplies but less for textbooks than do non-IGE schools. Teachers in the IGE schools devoted significantly more time to one-to-one instruction and significantly less time to large-group instruction than did non-IGE teachers. (Author/IRT)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED140490

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Technical Paper No. 410

RESOURCE ALLOCATION AND TIME UTILIZATION IN IGE AND NON-IGE SCHOOLS

by

Richard A. Rossmiller and Terry G. Geske

Report from the Project on
Organization for Instruction and
Administrative Arrangements

Richard A. Rossmiller
Faculty Associate

Wisconsin Research and Development
Center for Cognitive Learning
The University of Wisconsin
Madison, Wisconsin

January 1977

EA 009 665

Published by the Wisconsin Research and Development Center for Cognitive Learning, supported in part as a research and development center by funds from the National Institute of Education, Department of Health, Education, and Welfare. The opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education and no official endorsement by that agency should be inferred

Center Contract No. NE-C-00-3-0065

WISCONSIN RESEARCH AND DEVELOPMENT CENTER FOR COGNITIVE LEARNING

MISSION

The mission of the Wisconsin Research and Development Center for Cognitive Learning is to help learners develop as rapidly and effectively as possible their potential as human beings and as contributing members of society. The R&D Center is striving to fulfill this goal by

- conducting research to discover more about how children learn
- developing improved instructional strategies, processes and materials for school administrators, teachers, and children, and
- offering assistance to educators and citizens which will help transfer the outcomes of research and development into practice

PROGRAM

The activities of the Wisconsin R&D Center are organized around one unifying theme, Individually Guided Education.

FUNDING

The Wisconsin R&D Center is supported with funds from the National Institute of Education; the Bureau of Education for the Handicapped, U.S. Office of Education; and the University of Wisconsin.

ACKNOWLEDGEMENTS

The authors wish to express their appreciation to the following people for assistance during this research project:

- To Donald McIsaac and Larry Winkler who provided valuable assistance during the data analysis process

- To the researchers in the R3 and Evaluation components at the Center who provided assistance during the data collection process

- To the people in the schools who participated in the study and made this research possible.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	vii
ABSTRACT	ix
CHAPTER	
I. INTRODUCTION	1
Purpose of the Study	3
Cost Studies of IGE	4
Time and Learning	6
II. METHODOLOGY	10
Sample Selection	10
Instrumentation	16
Data Collection Procedures	19
III. ANALYSIS OF THE DATA	22
Treatment of the Data	22
Results of the Data Analysis	22
IV. SUMMARY AND CONCLUSIONS	39
Summary	39
Conclusions	41
Implications	43
BIBLIOGRAPHY	45
APPENDICES	47
A. Organizational Structure of the Multiunit School	47
B. Instructional Programming Model	49
C. Telephone Survey Form	51
D. School Expenditure Data Instrument	59
E. Time Allocation of Instructional Personnel Instrument	68
F. General Information Letter	72

LIST OF TABLES

Table		Page
1	Selected Characteristics of IGE Schools Included in the Sample	14
2	Selected Characteristics of Matched IGE and Non-IGE Schools	15
3	Costs Per Pupil for Selected Expenditure Categories in IGE Schools	24
4	T-Test Values for Selected Expenditure Categories in Matched IGE and Non-IGE Schools	25
5	Time Allocation of Teachers in IGE Schools	28
6	T-Test Values for Time Allocation Categories for Teachers in Matched IGE and Non-IGE Schools	31
7	Comparison of Time Allocation for Unit Leaders and Teachers in IGE Schools	34
8	Time Allocation of Principals in IGE Schools	36
9	T-Test Values for Time Allocation Categories for Principals in Matched IGE and Non-IGE Schools	37

Abstract

This study examined the cost implications of implementing and operating the IGE/MUS-E school, and also examined how instructional personnel spend their time in IGE schools. The study addressed two basic questions:

1. Do IGE schools cost more or exhibit different expenditure patterns than non-IGE schools?

2. Do instructional personnel in IGE schools allocate their time differently than instructional personnel in non-IGE schools?

Data for the study were obtained from a random sample of 41 IGE schools and 15 pairs of matched IGE and non-IGE schools drawn from 13 states. Two instruments--the School Expenditure Data form and the Time Allocation of Instructional Personnel form--were developed and used to collect data for this study. Descriptive data were presented for the sample of 41 IGE schools and t-tests for dependent samples were calculated to determine if the difference between the means were significant for any of the school expenditure and time allocation categories for the 15 pairs of matched IGE and non-IGE schools.

Our first basic conclusion was that IGE schools do not cost more than non-IGE schools. The differences between the mean expenditures for the 15 pairs of matched IGE and non-IGE schools were not statistically significant for any of the expenditure categories. The analysis of the data disclosed that IGE schools spent more for instructional supplies and other supplies but less for textbooks than did non-IGE schools. Our second basic conclusion was that teachers in IGE schools do spend their time differently than their counterparts in non-IGE schools. The

differences between the means for the IGE teachers and non-IGE teachers were statistically significant for the time allotted to several of the subcategories. IGE teachers devoted significantly more time to 1:1 instruction, especially in reading and mathematics, and significantly less time to large group instruction than did non-IGE teachers. The analysis of the data also revealed that principals in IGE schools devoted less time to non-instructional activities than did non-IGE principals.

I

INTRODUCTION

Individually Guided Education (IGE) offers a major alternative to the traditional age-graded, self-contained classroom form of schooling at the elementary level.[1] The comprehensive IGE system consists of seven major components:

1. a model for organizational-administrative arrangements--the multiunit school
2. a model of instructional programming
3. a model for measurement and evaluation
4. curriculum materials and instructional procedures
5. a program of home-school-community relations
6. a network of facilitative environments
7. continuing research and development.

The organizational structure of the multiunit elementary school (MUS-E) is designed to facilitate open communication among school personnel and promote instructional programming for the individual student (see Appendix A). Designed to provide a hospitable environment for all of the components of IGE, the organizational hierarchy of the multiunit school consists of three interrelated groups: the Instruction and Research unit (I & R) at the student level, the Instructional Improvement Committee (IIC) at the building level, and the Systemwide Program Committee (SPC) at the district level. The MUS-E organizational model makes use of differentiated staffing, team teaching, multi-age grouping, continuous progress, and shared decision-making.

A key component of the IGE system is the Instructional Programming Model (IPM) for the individual student (see Appendix B). The IPM is designed to assess each student's beginning level of performance, rate of progress, style of learning, and other behavioral characteristics. The model is used with explicitly stated instructional objectives and specified criteria which are used to assess progress toward the attainment of the objectives.

The third major component, a model of evaluation, facilitates instructional decision-making. The model for evaluating student learning involves five steps: (1) formulate instructional objectives, (2) set performance criteria, (3) measure progress toward objectives, (4) compare measurement to criteria, and (5) make decisions. The IIC, interacting with the staff of the I & R units, is responsible for determining objectives for the entire school, and the I & R unit is responsible for determining objectives for the unit and individual students within the unit.

The success of IGE depends heavily upon the development and availability of curricular materials and instructional procedures that are compatible with the IPM. Curricular materials developed to accommodate a variety of individual differences among pupils should incorporate four main attributes: (1) the materials should be accurate and reliable; (2) the materials should be learnable; (3) the materials and related activities should be teachable; and (4) the materials should be accessible to the staff and usable in an instructional setting.

The success of an IGE school also depends on an effective program of home-school-community relations. The IGE system purposely encourages

meaningful parental and citizen involvement in the school organization at all levels. The program of home-school-community relations has three general objectives:

1. To ensure that the staff is aware of available resources and is responsive to the educational expectations of the community, parents, and students.
2. To ensure that the community, parents, and students are aware of and responsive to the requirements for implementing IGE.
3. To ensure that staff and community are involved actively in both the changeover to IGE and the refinement of IGE.

The sixth component, a supportive network of facilitated environments, is necessary to maintain and strengthen each IGE school. Facilitative environments consisting of human and material resources are both intraorganizational and extraorganizational in nature. The intraorganizational environment is provided by the multiunit structure; extraorganizational environments are provided by state education agencies, intermediate education agencies, teacher education institutions, and other groups such as teachers' associations and parent organizations. The final component of IGE is a program of continuing research and development to generate knowledge which contributes to an ongoing refinement of the IGE system.

Purpose of the Study

Citizens, school board members, and school personnel are increasingly requesting information about the cost of the IGE school, and how this cost compares with the costs of the other forms of elementary schooling. Although considerable research has been conducted regarding role expectations, leadership styles, and decision-making in the multiunit elementary school, very little attention has been devoted to the

costs associated with implementing and operating an IGE school. At the same time, several researchers have recently stressed the importance of the variable of time in the learning process. The amount of time a teacher spends in the classroom or the amount of time a student is actually exposed to instruction has been shown to have a significant impact on achievement. Since 70 to 80 percent of the typical educational budget is expended for wages and salaries, the manner in which school personnel spend their time clearly has cost implications. This study therefore examined school expenditure data for IGE and non-IGE schools, and also examined how instructional personnel spend their time in IGE and non-IGE schools. Essentially, the study addressed two basic questions:

1. Do IGE schools cost more or exhibit different expenditure patterns than non-IGE schools?
2. Do instructional personnel in IGE schools allocate their time differently than instructional personnel in non-IGE schools?

Cost Studies of IGE

Evers conducted a study in 1972 to identify any increase or decrease in expenditures by schools during their first year of implementing IGE/MUS-E.[2] A survey instrument was developed to collect data for expenditures in the categories of student costs, staff costs, staff development, instructional materials and equipment, and physical plant and furnishings. Based on data obtained from a stratified sample of 39 schools in eight states, Evers drew the following conclusions with regard to the first-year costs of implementing IGE:

1. The majority of the schools reported no increase or decrease in expenditures related to vandalism and pupil absenteeism.

2. The majority of the schools reported no change in the number of certified teachers, central office personnel, special teachers, substitute teachers, paid student teachers, or custodians who were employed.

3. The majority of the schools reported a greater number of paid paraprofessionals; the median increase was four.

4. Disregarding normal salary increments, the majority of the schools reported no increase or decrease in expenditures for salaries of unit leaders, certified teachers, paid paraprofessionals, substitute teachers, special teachers, central office personnel, paid student teachers and custodians.

5. The majority of the schools reported higher expenditures for inservice materials; the median reported increase was $250.

6. The majority of the schools reported higher expenditures for workshops and conferences; the median reported increase was $500.

7. The majority of the schools reported no increase or decrease in expenditures for consultant services.

8. The majority of the schools reported no increase or decrease in expenditures for instructional materials and equipment.

9. The majority of the schools reported they were able to use materials and equipment more efficiently.

10. The majority of the schools reported no increase or decrease in expenditures for school plant and furnishings.[3]

A similar study was conducted by Boardman and Hudson in 1973 to examine both the start-up (first-year implementation) and ongoing (second-year) costs of IGE.[4] The authors were basically concerned with the development of a cost analysis model that could be used to identify the various cost factors directly associated with the implementation and continuation of IGE. A secondary purpose of the study was to estimate expenditure changes that resulted from the adoption of the IGE program. A sample of eight IGE schools representing six different school districts in a single midwestern state was used to investigate the following cost categories: (1) staff development, (2) instructional

personnel, (3) instructional materials, (4) administration, (5) public relations, (6) physical plant, and (7) league participation.

The authors reported an increase in expenditures for staff development. For the schools sampled, the average expenditure for preservice IGE workshops was $4,738 and the average expenditure for inservice IGE workshops was $1,805. Expenditures for inservice materials were high, but costs for visitations, consultants, and professional books were very low. Additional expenses for instructional personnel were attributable to a more extensive use of aides (approximately $7,900) and the additional stipends (averaging $300) paid unit leaders.

The schools sampled reported no additional expenditures for instructional materials and equipment for either classrooms or the resource center as a result of implementing the IGE program. These schools also reported no increase in costs for secretarial and administrative tasks because of the IGE program. In addition, reports of "no expenditure" on facilities for IGE programs reflected the opinion of school officials that any building changes and new furnishings would have been provided regardless of the type of instructional program used. Finally, three of the eight schools reported expenditures for public relations (averaging $34 per school) to disseminate information about IGE to their communities, and no costs were reported for participation in a university sponsored league.

Time and Learning

A number of researchers have attempted to examine the impact of several socioeconomic and school variables collectively through the concept of "time" or "foregone" learning. Bloom recently reported some

interesting findings on the relationship between time and learning.[5] After reviewing several well known studies on learning, Bloom pointed out that a student in one set of communities and schools may spend about two years to learn what a student in another set of communities and schools will learn in one year. "Or, to put it into time and human resources spent, it may cost twice as much for a particular level of learning in one place as it does in another place."[6]

Acknowledging that Carroll's model of school learning had significantly influenced his thinking,[7] Bloom discussed the notion of elapsed time--the amount of time spent from the beginning of a learning unit until the completion of the unit at the criterion level of mastery. Bloom suggested that student variation in total elapsed time is about 5 to 1. In other words, because of differences in learning rates, the slowest 5 percent of the learners take about five times as much time to reach the criterion as do the fastest 5 percent of the learners. The amount of elapsed time, however, decreases as the student progresses through a sequential set of learning units, eventually approximating a ratio of 3 to 1.

Bloom also discussed the notion of "time on task," or the amount of time the learner is actually engaged in learning. Intelligence and aptitude tests are good predictors of the percent of elapsed time that students will spend on task in the beginning of a course. As students proceed through the course, however, the percent of time on task is largely determined by (1) the student's achievement over the preceding units of the course, (2) his interest in the subject, and (3) the quality of instruction provided. Bloom reported that the multiple correlations

of these three variables with achievement are typically about .85 and with time on task about .75. The author concludes that additional research is needed to gain a better understanding of time and its utilization in school learning.

Wiley and Harnischfeger developed a conceptual model based on the notion that the amount of schooling students receive has a significant impact on their achievement.[8] The model delineated three subcomponents which determine quantity of schooling: (1) attendance, (2) length of school day, and (3) length of school year. The model also links individual pupil characteristics, individual pupil attendance, teacher characteristics, and instructional quality to exposure time. Based largely on Carroll's model of school learning, the authors specify achievement as basically a function of four fundamental time factors: (1) total allocated exposure time, (2) percent usable exposure time, (3) percent active learning time, and (4) total needed learning time. After applying the model to some simple elementary and secondary school statistics of selected states, they concluded that of the four time factors influencing achievement, the variable "total allocated exposure time" would be most amenable to important policy modifications. They further pointed out the wide variation that exists in the amounts of exposure allocated to pupils within classes, between classes, between schools, and between districts, and contended that instructional time can be reallocated by altering policies that are directly under the control of states and districts.

Footnotes

1. Herbert J. Klausmeier, et al, Individually Guided Education and the Multiunit Elementary School: Guidelines for Implementation, (Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1971).

2. Nancy A. Evers, IGE/MUS-E First-year Implementation Cost Survey, Technical Report No. 256 (Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1973).

3. Ibid., pp. 34-46.

4. R. G. Boardman and C. C. Hudson, Development of a Cost Analysis Model Which Schools May Use to Determine Budget Needs for Implementing Individually Guided Education (IGE), (Lincoln, Nebraska: Teachers College, University of Nebraska, 1973).

5. Benjamin S. Bloom, "Time and Learning," American Psychologist, (September, 1974), pp. 682-688.

6. Ibid., p. 682.

7. See J. B. Carroll, "A Model of School Learning," Teachers College Record, (May, 1963).

8. David E. Wiley and Annegret Harnischfeger, "Explosion of a Myth: Quantity of Schooling and Exposure to Instruction, Major Educational Vehicles," Educational Researcher, (April, 1974).

II

METHODOLOGY

During the summer of 1975 the staff of the Wisconsin Research and Development Center's Organizational and Administrative Arrangements and Cost-Effectiveness projects formulated plans to conduct jointly a major study involving a national sample of IGE schools. The Center's Evaluation component also participated in the research to obtain data needed for a comparative study involving a small sample of both IGE and non-IGE schools. The collaborative effort made it possible to achieve greater efficiency in the conduct of the various research efforts by utilizing the same sample population to obtain data for several studies.

The studies designed for the Organizational and Administrative Arrangements project required the gathering of data concerning student achievement, student self concept, organizational structure and leader behavior; those designed for the Cost-Effectiveness project required data concerning expenditures for instruction and the use of time by teachers and administrators; the research conducted by the Evaluation component entailed measurement of the degree to which the seven basic components of IGE had been implemented in the schools as well as definition and measurement of the direct and indirect outcomes of IGE schooling. The remainder of this section describes the sample selection, instrumentation, and data collection procedures employed in this study.

Sample Selection

The sample for the study consisted of 41 IGE schools and 15 non-IGE schools drawn from 13 states. The Research and Development Center's

1973-74 IGE Multiunit Elementary School Directory was used to identify a population of 959 schools which had used the IGE system for at least two years. Approximately 20 percent of these schools were located in urban areas and a stratified random sampling procedure was used to insure a representative sample. The IGE schools were stratified into "city" and "other" classifications, with the former category including those schools located in urban areas with a population of at least 200,000 and the latter category including those with a population under 200,000 according to 1970 census data. A random sample of the schools in each of these groups was drawn and a telephone survey (see Appendix C) was conducted to solicit information from the schools and request their cooperation in the study.

The telephone interview schedule was designed to determine whether or not a school met the following minimal criteria established for participation in the study:

1. The entire school had to conform to the multiunit organizational pattern;
2. The school had to utilize multi-age grouping in each of the I & R units;
3. The instructional programming model had to have been in use for reading for at least two years and for mathematics for at least one year;
4. The school had to have I & R units which met at least once a week, and a functionong instructional Improvement Committee;
5. The unit leaders could not be new to the selected unit, nor could more than one-half of the teachers be new to the selected unit.

A sample consisting of 41 IGE schools was obtained by calling in order the randomized schools in each group. Approximately 100 schools classified as "other" were called to obtain 33 schools that (1) met the established criteria and (2) were willing to participate in the study. Likewise, approximately 50 "city" schools were called to obtain eight urban schools. Within each of these 41 schools, one intermediate I & R unit in which the data concerning students and teachers would be gathered was chosen randomly.

The sample of matching non-IGE schools, of course, could not be selected until the sample of IGE schools had been chosen. The following basic criteria were established to identify non-IGE schools which would match, as closely as possible, the IGE schools:

1. The school should be located in the same or an adjacent school district;
2. The school should have a self-contained, age-graded traditional organization;
3. The school should be similar in terms of size, socioeconomic characteristics, staff experience, and the like;
4. The school should contain grade levels that paralleled the intermediate unit level in IGE schools.

Selection of non-IGE schools was completed between November 15 and December 15 to meet the schedule for data collection that had been established for January, 1976. The basic procedure followed was to call the superintendent of the school district in which a participating IGE school was located and ask him, or a designate, to identify a non-IGE school within the district that met the foregoing criteria. The final

sample consisted of 15 matched pairs of IGE and non-IGE schools. The sample size of 15 was decided upon because of time constraints, problems in identifying suitable non-IGE schools, and difficulties in obtaining district approval to conduct the research which precluded selection of a large sample of matched schools. Within each of the 15 non-IGE schools, classes of the appropriate age and grade level were randomly selected to approximate the size of the IGE school's intermediate unit.

Selected characteristics of the 41 IGE schools and the 15 pairs of matched IGE and non-IGE schools are presented in Tables 1 and 2. The data for these tables were obtained from information published by the National Center for Education Statistics (NCES). Data drawn from the 1970 census were tabulated for school districts in each state by the NCES. It should be emphasized that while these data may accurately characterize a given school district, they may not accurately characterize a specific school attendance area within the district. In fact, the larger the school district, the less likely that these data will accurately reflect a given attendance area.

In Table 1 are presented for each school its classification (other or urban) and enrollment, the population and median family income for the district, and the percent of population age 25 and over with at least twelve years of schooling in the district. Table 2 presents the same set of characteristics for the matched pairs of IGE and non-IGE schools. As indicated in Table 2, four of the matched pairs involved schools in adjacent districts (schools nos. 1 and 1, 19 and 4, 21 and 6, and 37 and 13). While schools 21 and 6 appear to be mismatched, school 21 was located in a suburban district adjacent to the city district

TABLE 1

SELECTED CHARACTERISTICS OF IGE SCHOOLS INCLUDED IN THE SAMPLE

School	School Classification	School Enrollment	School District Population	Median Family Income in School District	Percent of Population of District Age 25 and Over with at least 12 Years of Schooling
1	Other	387	2,665	9,971	47.9
2	City	800	3,392,638	10,336	60.0
3	Other	460	30,817	10,124	61.1
4	Other	280	10,502	7,197	61.9
5	Other	381	12,151	7,930	50.8
6	Other	180	60,396	8,928	71.2
7	Other	450	60,396	8,928	71.2
8	Other	293	14,028	8,038	47.1
9	Other	400	22,151	13,248	64.5
10	Other	500	52,851	10,650	52.4
11	Other	585	68,039	11,074	73.3
12	Other	302	3,820	9,926	55.0
13	City	1,050	3,365,020	10,244	43.9
14	Other	356	157,355	9,849	72.4
15	Other	900	102,551	7,954	28.8
16	Other	400	7,251	9,858	52.9
17	Other	590	30,102	10,862	52.4
18	City	534	280,392	10,108	50.0
19	Other	200	12,555	9,825	51.8
20	City	437	280,392	10,968	54.6
21	Other	389	4,280	29,075	90.0
22	Other	550	82,547	9,164	45.8
23	Other	270	26,972	10,480	62.2
24	Other	354	182,235	8,533	52.6
25	Other	200	15,694	8,186	69.4
26	City	540	807,057	9,748	52.2
27	Other	453	6,833	10,122	48.6
28	City	590	359,560	7,026	37.1
29	City	950	359,560	7,026	37.1
30	City	289	359,560	7,026	37.1
31	Other	730	197,459	10,428	70.9
32	Other	857	63,751	10,912	61.8
33	Other	580	24,404	9,526	52.9
34	Other	320	55,970	10,090	63.4
35	Other	430	105,869	10,226	59.6
36	Other	419	60,028	9,271	61.0
37	Other	500	8,434	10,106	62.1
38	Other	570	6,790	9,921	67.0
39	Other	450	37,677	8,645	56.9
40	Other	175	13,711	8,402	51.3
41	Other	435	52,199	11,854	63.5

Source: National Center for Education Statistics, 1970.

TABLE 2

SELECTED CHARACTERISTICS OF MATCHED IGE AND NON-IGE SCHOOLS

School	School Classification	School Enrollment	School District Population	Median Family Income in School District	Percent of Population of District Age 25 and Over with at least 12 Years of Schooling
I* 1	Other	387	2,665	9,971	47.9
N** 1	Other	505	8,538	9,030	44.0
I 7	Other	450	60,396	8,928	71.2
N 2	Other	470	60,396	8,928	71.2
I 14	Other	365	157,355	9,849	72.4
N 3	Other	400	157,355	9,849	72.4
I 19	Other	200	12,555	9,825	51.8
N 4	Other	250	15,911	9,626	51.4
I 20	City	437	280,392	10,968	54.6
N 5	City	478	280,392	10,968	54.6
I 21	Other	389	4,280	29,075	90.0
N 6	City	460	319,523	10,054	47.3
I 23	Other	270	26,972	10,480	62.2
N 7	Other	174	26,972	10,480	62.2
I 24	Other	354	182,235	8,533	52.6
N 8	Other	357	182,235	8,533	52.6
I 27	Other	453	6,833	10,122	48.6
N 9	Other	491	6,833	10,122	48.6
I 29	City	950	359,560	7,026	37.1
N 10	City	784	359,560	7,026	37.1
I 31	Other	750	197,459	10,428	70.9
N 11	Other	750	197,459	10,428	70.9
I 36	Other	419	60,028	9,271	61.0
N 12	Other	406	60,028	9,271	61.0
I 37	Other	500	8,434	10,106	62.1
N 13	Other	350	16,666	9,936	65.9
I 39	Other	450	37,677	8,645	56.9
N 14	Other	479	37,677	8,645	56.9
I 41	Other	435	52,199	11,854	63.5
N 15	Other	470	52,199	11,854	63.5

* IGE Schools
** Non-IGE Schools

Source: National Center for Education Statistics, 1970.

in which school 6 was located and the characteristics of these two attendance areas were much more similar than the district figures indicate.

Instrumentation

The School Expenditure Data form was developed and used in this study to obtain expenditure information for a specific school within a given school district (see Appendix D). A second instrument--Time Allocation of Instructional Personnel--was also developed to collect data concerning the way in which instructional personnel in IGE and non-IGE schools spend time (see Appendix C). The school expenditure and time allocation forms were pilot tested in two schools in Wisconsin in November, 1975, and were revised based upon the feedback obtained from these two schools.

Since few school districts maintain complete financial records on a school-by-school basis, the school expenditure instrument included only those cost categories considered to be most directly related to instruction and most likely to be maintained for individual schools within the district. The expenditure categories used were based on those defined in Financial Accounting for Local and State School Systems.[9] The expenditure form was to be completed by the school principal or a designate, e.g., superintendent of business manager. The expenditure data requested were for the 1974-75 school year, the most recent school year for which data were available.

The School Expenditure Data form included four major expenditure categories: (1) Instruction, (2) Operation of Plant, (3) Repairs to

Plant and Equipment, and (4) Capital Outlay. The Instruction category was further subdivided to identify expenditures for Salaries, Supplies and Materials, Textbooks, Library and Audiovisual, and Other Expenses; Operation of Plant included Salaries, Supplies and Materials, Utilities, and Other Expenses; Repairs to Plant and Equipment consisted of a single line item; and Capital Outlay included both replacement of instructional equipment and additions to instructional equipment. Specific definitions of the various expenditure categories were attached to the instrument.

The instructions on the second instrument--Time Allocation of Instructional Personnel--requested designated personnel in the schools sampled to estimate the total amount of time, both in-school and out-of school, that they devoted to their professional responsibilities (see Appendix E). The respondents were asked to divide their total time between "Direct Instruction of Pupils" and "Activities Other Than Direct Instruction of Pupils." They were then asked to partition further the total amount of their direct instructional time by curricular areas, e.g., reading, language arts, mathematics, science, social studies, and other, and by mode of instruction, e.g., independent study or one-to-one, small group (3-5 students), class-size group (25-35 students), and large group (75-150 students). Similarly, they were asked to partition their non-instructional time into eight subcategories which were defined and described: (A) Supervision of Pupils, (B) Planning, (C) Testing/Assessing/Evaluation, (D) Record Keeping, (E) Inservice Training, (F) Clerical/Secretarial, (G) Administrative, and (H) Other. The respondents were allowed to report the amount of time they spent per week in each of

these various activities in either hours or percentage of total time. The instructions indicated that "best estimates" were sufficient and that "stop watch" accuracy was neither expected nor required.

The time allocation instrument gave directions for completing the form to the principal, unit leader, unit teacher, aide, intern, or unit secretary in IGE schools, and the principal, teacher, aide, or intern in non-IGE schools. In Category II--Direct Instruction of Pupils, under mode of instruction, the subcategory entitled "large group" (75-150 students) used for IGE schools was changed to "More than One Class" for the non-IGE schools. Except for the minor differences noted above, the instruments used in the IGE and non-IGE schools were identical.

A total of 35 of the 41 IGE schools (85 percent) and 14 out of the 15 non-IGE schools (93 percent) returned properly completed School Expenditure Data forms. At the same time, 245 participants in 39 of the 41 IGE schools and 94 participants in all 15 non-IGE schools returned completed time allocation forms. Of the 245 forms returned from the IGE schools, 171 (70 percent) were usable and of the 94 forms returned from the non-IGE schools, 85 (90 percent) were usable. The 171 usable time allocation forms from the IGE schools were obtained from 28 principals, 29 unit leaders, 94 teachers, and 20 aides. The 85 valid forms from the non-IGE schools were obtained from 12 principals, 66 teachers, and 7 aides.

A number of the time allocation instruments could not be used because the respondents did not properly complete the forms. A few of the respondents who reported extraordinarily high or low amounts of time, e.g., 10 hours or 85 hours, apparently failed to report all of

the time they devoted to their professional responsibilities or overestimated the time they devoted to some of the various activities. It was decided to exclude from the analyses reported times that totaled less than 20 hours or more than 60 hours a week. Likewise, some of the respondents who reported percentages of time failed to report the total number of hours against which the percentages could be applied. In addition, some of the respondents started to complete the form but simply did not finish it.

Data Collection Procedures

After a school was selected for possible participation in the study, the research staff sent a general informational letter to the principal to explain the research project in detail (see Appendix F). After a school had agreed to participate in the study, an intermediate unit in the school was randomly selected and a letter was sent explaining the necessary testing procedures. The school expenditure and time allocation forms were included in a packet containing several research instruments that was mailed to the school approximately one month prior to the on-site visitation and testing of pupils. The participants were asked to complete the instruments prior to the researchers' visit to the school.

Once the sample of IGE schools was finalized, the research staff made arrangements to visit the 41 schools and the Evaluation component began the process of selecting the matching non-IGE schools. Letters explaining the research project and the necessary testing procedures were sent to the non-IGE schools that had been selected for participation

in the study. Researchers from the Research and Development Center visited the 41 IGE schools and 15 non-IGE schools during January and February, 1976. During the on-site visits, the researchers met with the principal and members of the instructional staff, collected the completed instruments including the school expenditure and time allocation forms, finalized the testing procedures, and administered the tests. In addition, researchers from the Evaluation component conducted in-depth interviews with the principal and selected instructional personnel in the 15 pairs of matched IGE and non-IGE schools.

Footnotes

9. Paul L. Reason and Alpheus L. White, Financial Accounting For Local and State School Systems, (Washington, D. C.: U. S. Government Printing Office, 1957).

III

ANALYSIS OF THE DATA

In this section we present the findings derived from an analysis of the school expenditure data reported by schools and the time allocation data reported by teachers and principals. The first part of this section describes the treatment of the data; the remainder is devoted to a presentation and analysis of the data.

Treatment of the Data

Descriptive statistics were calculated for the entire sample of 41 IGE schools in order to provide general information with regard to expenditures and allocations in these schools. The means, standard deviations, and number of schools reporting were computed for the various school expenditure and time allocation categories. In addition, t-tests for dependent samples were calculated for the 15 matched pairs of IGE and non-IGE schools to determine if the differences between the means in any of the school expenditure and time allocation categories were significant. The means, t-test values, and number of schools reporting are presented for the matched pairs.

Results of the Data Analyses

School Expenditure Data

The data for school expenditures most directly related to the instructional program (standardized on a per pupil basis) are presented in Tables 3 and 4. The costs per pupil for the selected expenditure

categories are presented in Table 3 for the sample of 41 IGE schools. The table shows the means, standard deviations, and number of IGE schools reporting for each expenditure category. Under the Instruction category, for example, the mean per pupil expenditure for salary of the principal was $45.37 and the standard deviation was $19.88. A total of 35 schools reported expenditures for this particular item.

Expenditures for salaries of instructional personnel far outweighed all other expenditures for instruction, accounting for over 95 percent of the total. The expenditure for salaries of instructional personnel was $655.76 per pupil compared to an average total expenditure per pupil of $33.34 for instructional supplies, textbooks and other expenses. Expenditures for plant operation averaged $89.20 per pupil, those for repairs averaged $8.78 per pupil, and expenditures for capital outlay averaged $6.07 per pupil.

The t-test values for the selected expenditure categories in the matched pairs of IGE and non-IGE schools are reported in Table 4. The table presents the means for the IGE and non-IGE schools, the t-test values, the probability level of each t-test value, and the number of matched pairs of schools reporting. If a given school did not report expenditure data for a particular line item, both that school and the school with which it was matched were omitted from the sample for purposes of the analysis of that item. Accordingly, the number of matched pairs reporting for the various expenditure categories ranged from 0 to 11. The mean per pupil expenditure pattern in the 15 IGE schools was similar to that for the entire sample of IGE schools, although the expenditures were somewhat lower.

TABLE 3

COSTS PER PUPIL FOR SELECTED EXPENDITURE CATEGORIES
IN IGE SCHOOLS

Expenditure Categories	Mean	Standard Deviation	Number of Schools Reporting
I. Instruction			
1. Principal(s) Salary	45.37	19.88	35
2. Teachers' Salary	511.34	228.42	35
3. Other Certified Personnel	62.20	67.85	28
4. Secretarial/Clerical	22.30	14.39	35
5. Other Salaries	32.57	27.87	29
6. Total Salaries	655.76	282.52	35
7. Instructional Supplies	14.07	13.58	34
8. Other Supplies	3.19	3.23	28
9. Total Supplies	16.22	15.10	35
10. Textbooks	7.19	4.88	30
11. Library Books	4.08	3.78	35
12. Periodicals/Newspapers	.56	.88	30
13. Audio-Visual	2.79	2.75	31
14. Other	1.07	1.36	18
15. Total Books	13.75	9.95	35
16. Travel	1.44	1.68	30
17. Expenses for Inservice	1.28	1.61	21
18. Other Expenses	2.38	4.37	16
19. Total Other Expenses	3.37	5.00	32
II. Plant Operation			
20. Plant Engineer(s) Salary	13.18	13.53	16
21. Custodian(s) Salary	42.00	22.94	34
22. Supplies and Materials	5.22	6.07	27
23. Utilities	37.78	51.67	31
24. Other Expenses	5.46	9.72	15
25. Total Plant Operation Expenses	89.20	78.56	34
III. Repairs to Plant			
26. Repairs to Plant	8.78	10.39	27
IV. Capital Outlay			
27. Replace Instructional Equipment	3.39	4.00	25
28. Add Instructional Equipment	3.65	4.85	30
29. Total Capital Outlay	6.07	8.15	32

TABLE 4

T-TEST VALUES FOR SELECTED EXPENDITURE CATEGORIES
IN MATCHED IGE AND NON-IGE SCHOOLS

Expenditure Categories	Means IGE	Means NON-IGE	T-Test Values	Probability	Matched Pairs Reporting
I. Instruction					
1. Principal(s) Salary	39.32	35.28	1.25	.24	11
2. Teachers' Salary	453.61	415.64	1.14	.28	11
3. Other Certified Personnel	49.13	71.04	-1.01	.34	8
4. Secretarial/Clerical	20.16	17.12	1.48	.17	11
5. Other Salaries	45.89	25.64	1.32	.23	7
6. Total Salaries	599.32	546.35	0.91	.39	8
7. Instructional Supplies	11.56	8.71	2.09	.06	11
8. Other Supplies	3.12	1.01	2.20	.07	7
9. Total Supplies	13.59	9.80	1.70	.13	8
10. Textbooks	5.34	7.96	-2.21	.06	9
11. Library Books	3.15	2.92	0.29	.78	11
12. Periodicals/Newspapers	.35	.35	0.05	.96	8
13. Audio-Visual	1.79	1.91	-0.22	.83	9
14. Other	.37	.76	-0.54	.62	4
15. Total Books	9.36	12.76	-1.84	.11	8
16. Travel	.92	.47	1.45	.18	10
17. Expenses for Inservice	.81	.35	1.48	.21	5
18. Other Expenses	.79	.18	1.14	.46	2
19. Total Other Expenses	0.00	0.00	-	-	0
II. Plant Operation					
20. Plant Engineer(s) Salary	19.29	17.80	.42	.70	4
21. Custodian(s) Salary	38.24	31.68	1.37	.20	11
22. Supplies and Materials	3.50	5.09	-1.37	.21	8
23. Utilities	22.56	22.00	0.17	.87	10
24. Other Expenses	5.15	4.16	0.29	.79	4
25. Total Plant Operation Expenses	74.25	65.88	0.77	.46	8
III. Repairs to Plant					
26. Repairs to Plant	5.25	6.72	-0.61	.56	8
IV. Capital Outlay					
27. Replace Instructional Equipment	1.70	2.54	-0.93	.39	7
28. Add Instructional Equipment	2.89	2.34	-0.69	.51	9
29. Total Capital Outlay	2.93	6.35	-2.73	.07	4

The mean per pupil expenditure for principal(s) salary was $39.32 in IGE schools and $35.28 in non-IGE schools. Based on data obtained from 11 matched pairs, the t-test value was 1.25 and the probability of this difference was .24, i.e., a difference of this magnitude could be expected by chance alone 24 out of 100 times. The mean per pupil expenditure for teachers' salaries was $453.61 in IGE schools and $415.64 in non-IGE schools. While teachers' salaries were somewhat higher in the IGE schools, salaries for other certified personnel were higher in non-IGE schools. In addition, the teachers' salary category includes unit leaders, who often receive additional compensation for the extra responsibilities they assume. Similarly, total expenditure for supplies was $13.59 per pupil in IGE schools and $9.80 in non-IGE schools; for books, $9.36 and $12.76; for plant operation, $74.25 and $65.88; and for capital outlay, $2.93 and $6.35. The mean per pupil expenditure for repairs to plant was higher for non-IGE schools in the matched pairs, as were the mean expenditures for books and capital outlay.

The differences between the mean expenditures of the IGE and non-IGE schools were not statistically significant at the .05 level for any of the expenditure categories. The differences between the means for IGE and non-IGE schools, however, did approach statistical significance for four of the expenditure categories. For instructional supplies, the t-test value was 2.09 with a probability of .06; for other supplies, the t-test value was 2.20 with a probability of .07; for textbooks, the t-test value was -2.21 with a probability of .06; and for total capital outlay, the t-test value was -2.73 with a probability of .07. IGE schools spent more for instructional supplies and other supplies but

less for textbooks than did non-IGE schools. The differences in mean expenditures in the plant operation, repairs to plant, and capital outlay categories are difficult to interpret, although expenditure for capital outlay is likely to involve large, non-recurring expenditures which are not directly related to whether or not the school is an IGE school.

Time Allocation Data

Data concerning the time allotted by teachers to various instructional and non-instructional activities are presented in Tables 5, 6, and 7. Table 5 provides a description of the way teachers in IGE schools allocated their time based on reports submitted by 94 teachers in IGE schools. The table presents the means and the standard deviations for IGE schools according to the way in which teachers reported spending their time. For example, the mean number of hours teachers spent per week in instructional activities was 23.73 and the standard deviation was 5.94. The mean number of hours per week spent in non-instructional activities was 18.30 with a standard deviation of 8.00.

The total amount of instructional time was partitioned by curricular area and by mode of instruction. For example, the mean number of hours per week spent in teaching reading on a 1:1 basis reported by teachers in IGE schools was 1.72. Similarly, the mean number of hours per week they spent in teaching reading in small groups was 2.31. The total amounts of time spent by mode of instruction and by curricular area are also reported. For example, the mean number of hours per week teachers spent in 1:1 teaching was 6.85 in the IGE schools and the mean

TABLE 5

TIME ALLOCATION OF TEACHERS IN IGE SCHOOLS
N = 94

		Mean	Standard Deviation
Total Instruc. Hours		23.73	5.94
Reading	1:1	1.72	1.78
	Small Gp.	2.31	2.33
	Class Size	1.91	2.46
	Large Gp.	0.02	0.13
	Other	0.01	0.13
Language Arts	1:1	1.08	1.38
	Small Gp.	0.60	1.05
	Class Size	2.33	2.00
	Large Gp.	0.03	0.16
	Other	0.00	0.00
Math	1:1	2.14	1.93
	Small Gp.	1.25	1.60
	Class Size	1.61	1.90
	Large Gp.	.005	0.05
	Other	0.00	0.00
Science	1:1	0.64	1.35
	Small Gp.	0.45	0.91
	Class Size	1.84	3.46
	Large Gp.	0.02	0.13
	Other	0.00	0.00
Social Studies	1:1	0.66	1.35
	Small Gp.	0.41	0.90
	Class Size	1.88	1.76
	Large Gp.	0.06	0.25
	Other	0.00	0.00
Other	1:1	0.61	1.17
	Small Gp.	0.39	0.89
	Class Size	1.73	2.96
	Large Gp.	0.05	0.28
	Other	0.00	0.00
Total Mode of Instruc. tion	1:1	6.85	5.52
	Small Gp.	5.41	4.37
	Class Size	11.29	7.79
	Large Gp.	0.18	0.50
	Other	0.13	0.13
Total Curricular Areas	Reading	5.97	3.06
	Language Arts	4.04	2.20
	Math	5.00	2.15
	Science	2.94	3.71
	Social Studies	3.01	2.38
	Other	2.76	3.38
Total Noninstruc. Hours		18.30	8.00
A. Supervision		1.20	1.42
B. Planning		6.16	4.70
C. Testing		3.05	3.10
D. Record Keeping		2.70	2.42
E. Inservice		0.76	1.16
F. Clerical		3.51	3.52
G. Administrative		0.31	0.64
H. Other		0.63	1.18

number of hours per week they spent teaching reading in all modes of instruction was 5.97. Thus 25 percent of the time spent in direct instruction of pupils was devoted to the teaching of reading. An average of 5.0 hours per week (21 percent of the time devoted to direct instruction of pupils) was spent in teaching mathematics, 4.04 hours per week (17 percent) in language arts, 2.94 hours (12 percent) in science, 3.01 hours (13 percent) in social studies, and 2.76 hours (12 percent) in other subjects.

With regard to the modes of instruction employed, teacher in IGE schools reported that they spent an average of 6.85 hours per week (29 percent of the time they devoted to direct instruction of pupils) to 1:1 teaching, 5.41 hours per week (23 percent) in small group instruction, 11.29 hours per week (48 percent) in instruction with a class-size group, with very little time spent in large group or other modes of instruction.

The total amount of time devoted to non-instructional activities was partitioned into eight subcategories. The mean number of hours per week spent in supervision by teachers in IGE schools was 1.20 and the mean number of hours spent in planning was 6.16. Teachers in IGE schools averaged 3.05 hours per week in testing, 2.7 hours per week in record keeping, .76 hours per week in inservice activities, 3.51 hours per week in clerical tasks, and .94 hours per week in administrative and other activities.

Differences in the time allocations of teachers in the matched pairs of IGE and non-IGE schools were compared. The t-test values for the differences between means of the time allocation categories are

reported in Table 6. The table shows the means for the IGE and non-IGE schools, the t-test values, and the probability level of the differences reported in the time allocation categories. The mean number of hours per week spent in instruction was 25.20 for teachers in IGE schools and 23.20 for teachers in non-IGE schools. Based on the 13 matched pairs for which data were available, the t-test value was 1.32 and the associated probability was .21. While the teachers in the IGE schools reported spending two more hours per week in teaching than their counterparts in non-IGE schools, the difference between the means of the two groups for total instructional hours was not statistically significant.

Although the difference in total instructional hours was not significant, the allocation of time to several of the instructional subcategories was statistically significant at the .05 level. For reading on a 1:1 basis, the t-test value was 2.24 with an associated probability of .04; for math on a 1:1 basis, the t-test value was 2.53 with a probability of .03; for math on a large group basis, the t-test value was -2.26 with a probability of .04; and for other curricular areas on a 1:1 basis, the t-test value was 2.29 with a probability of .04. In addition, for total instruction on a 1:1 basis, the t-test value was 3.22 with a probability of .007; and for total instruction on a large group basis, the t-test value was -2.29 with a probability of .02.

The mean number of hours per week devoted to non-instructional activities was 19.84 for teachers in IGE schools and 17.28 for teachers in non-IGE schools. The difference between the means, 2.56 hours, produced a t-test value of 1.12 with a probability of .29. While the difference between the means for total non-instructional time was not

TABLE 6

T-TEST VALUES FOR TIME ALLOCATION CATEGORIES FOR TEACHERS
IN MATCHED IGE AND NON-IGE SCHOOLS
N = 13

		Means IGE	Means Non-IGE	T-Test Values	Probability
Total Instruc. Hours		25.20	23.20	1.32	.21
Reading	1:1	1.66	0.73	2.24	.04
	Small Gp.	2.02	1.22	1.35	.20
	Class Size	2.03	2.47	-0.61	.55
	Large Gp.	0.04	0.40	-1.71	.11
	Other	0.00	0.25	-1.49	.16
Language Arts	1:1	1.12	0.53	1.21	.25
	Small Gp.	0.60	0.56	0.12	.90
	Class Size	2.42	2.93	-0.97	.35
	Large Gp.	0.04	0.02	-0.47	.65
	Other	0.00	0.04	-1.00	.34
Math	1:1	1.70	0.67	2.53	.03
	Small Gp.	1.06	0.84	0.47	.65
	Class Size	1.46	2.34	-1.66	.12
	Large Gp.	0.00	0.55	-2.26	.04
	Other	0.00	0.05	-1.00	.34
Science	1:1	0.94	0.13	1.27	.23
	Small Gp.	0.50	0.54	-0.23	.83
	Class Size	2.00	2.17	-0.81	.44
	Large Gp.	0.01	0.02	-1.00	.34
	Other	0.00	0.00	-	-
Social Studies	1:1	0.61	0.29	1.35	.20
	Small Gp.	0.49	0.56	-0.49	.63
	Class Size	2.43	2.70	-0.63	.54
	Large Gp.	0.05	0.25	-0.83	.42
	Other	0.00	0.00	-	-
Other	1:1	0.80	0.20	2.29	.04
	Small Gp.	0.57	0.43	0.64	.53
	Class Size	2.53	2.25	0.41	.69
	Large Gp.	0.13	0.04	1.47	.17
	Other	0.00	0.08	-1.43	.18
Total Mode of Instruc. tion	1:1	6.84	2.55	3.22	.007
	Small Gp.	5.24	4.15	0.78	.45
	Class Size	12.85	14.85	-0.96	.35
	Large Gp.	0.26	1.27	-2.59	.02
	Other	0.00	0.42	-1.70	.11
Total Curricular Areas	Reading	5.75	5.07	0.74	.48
	Language Arts	4.18	4.08	0.14	.89
	Math	4.22	4.47	-0.36	.73
	Science	3.43	2.85	0.84	.42
	Social Studies	3.58	3.79	-0.56	.59
	Other	4.03	3.00	1.50	.16
Total Noninstruc. Hours		19.84	17.28	1.12	.29
A. Supervision		1.41	2.14	-1.60	.14
B. Planning		8.35	5.86	1.71	.11
C. Testing		2.67	2.26	0.90	.39
D. Record Keeping		2.33	1.81	1.54	.15
E. Inservice		0.83	0.51	1.74	.11
F. Clerical		3.16	4.13	-1.11	.29
G. Administrative		0.24	0.10	1.59	.14
H. Other		0.94	0.20	2.42	.03

statistically significant, several subcategories of non-instructional activity displayed t-test values with probabilities of .15 or less, and the t-test for one subcategory--other activities--produced a probability of .03. For supervision, the t-test value was -1.60 with a probability of .14; for planning, the t-test value was 1.71 with a probability of .14; for planning, the t-test value was 1.71 with a probability of .11; for record keeping, the t-test value was 1.54 with a probability of .15; for inservice training, the t-test value was 1.74 with a probability of .11; and for administrative tasks, the t-test value was 1.59 with a probability of .14. Based on these data, it appears that teachers in the IGE schools spent more time (2.56 hours) on non-instructional activities than did the teachers in non-IGE schools. They reported spending more time on planning (2.49 hours), testing (.41 hours), record keeping (.52 hours), inservice training (.32 hours), administrative tasks (.14 hours) and other tasks (.74 hours). They reported spending less time supervising pupils (.73 hours) and performing clerical tasks (.97 hours).

The results of the analysis of the matched pairs of IGE and non-IGE schools indicated that teachers in IGE schools devote more time to their job (45 hours/week) than do teachers in non-IGE schools (40.5 hours/week). The IGE teachers devoted about two hours more per week to direct instruction of pupils than did the non-IGE teachers. Furthermore, they devoted significantly more time to 1:1 instruction, especially in reading and mathematics, and significantly less time to large group instruction than did the non-IGE teachers. IGE teachers devoted about 2.5 hours more per week to non-instructional tasks than

did non-IGE teachers. Nearly all of this added time was spent in planning. The additional time spent in testing, record keeping, inservice training, and administrative and other tasks was nearly offset by the reduced amount of time IGE teachers devoted to supervising pupils and performing clerical tasks.

Table 7 provides a comparison of the time allocations reported by 94 teachers and 29 unit leaders in the sample of IGE schools. The table presents the means and the standard deviations for teachers and unit leaders according to the time allocation categories. The mean number of hours per week spent in instructional activities was 23.73 for teachers and 23.85 for unit leaders--the standard deviations were 5.94 and 7.30, respectively. Likewise, the mean number of hours per week spent in non-instructional activities was 18.30 for teachers and 20.33 for unit leaders, with standard deviations of 8.00 and 7.75, respectively.

The teachers and unit leaders allocated nearly the same amount of time to instructional activities and distributed their teaching time by curricular areas and modes of instruction in a similar manner. The unit leaders did, however, tend to spend less time than teachers in 1:1 instruction and more time with class size groups. The unit leaders spent about two more hours per week, on the average, in non-instructional activities than did the teachers. Unit leaders spent more time than teachers in planning (.45 hours), testing (.21 hours), record keeping (.37 hours), and performing clerical (.52 hours), administrative (.33 hours), and other (.19 hours) tasks, and about the same amount of time as did teachers on supervision and inservice training.

TABLE 7

COMPARISON OF TIME ALLOCATION FOR UNIT LEADERS AND TEACHERS IN IGE SCHOOLS

		Means *		Standard Deviation	
		Unit Leaders	Teachers	Unit Leaders	Teachers
Total Instruc. Hours		23.85	23.73	7.30	5.94
Reading	1:1	1.54	1.72	1.72	1.78
	Small Gp.	1.98	2.31	2.34	2.33
	Class Size	2.37	1.91	2.56	2.46
	Large Gp.	0.03	0.02	0.19	0.13
	Other	0.00	0.01	0.00	0.13
Language Arts	1:1	0.90	1.08	1.07	1.38
	Small Gp.	0.53	0.60	0.90	1.05
	Class Size	2.74	2.33	1.92	2.00
	Large Gp.	0.10	0.03	0.41	0.16
	Other	0.00	0.00	0.00	0.00
Math	1:1	2.07	2.14	1.82	1.93
	Small Gp.	1.74	1.25	1.88	1.60
	Class Size	1.95	1.61	1.95	1.90
	Large Gp.	0.34	0.005	0.19	0.05
	Other	0.00	0.00	0.00	0.00
Science	1:1	0.38	0.64	0.92	1.35
	Small Gp.	0.30	0.45	0.63	0.91
	Class Size	1.41	1.84	1.41	3.46
	Large Gp.	0.10	0.02	0.31	0.13
	Other	0.00	0.00	0.00	0.00
Social Studies	1:1	0.57	0.66	1.04	1.35
	Small Gp.	0.24	0.41	0.41	0.90
	Class Size	2.32	1.88	2.08	1.76
	Large Gp.	0.07	0.06	0.26	0.25
	Other	0.00	0.00	0.00	0.00
Other	1:1	0.47	0.61	0.95	1.17
	Small Gp.	0.32	0.39	0.75	0.89
	Class Size	1.78	1.73	3.47	2.96
	Large Gp.	0.24	0.05	0.68	0.28
	Other	0.00	0.00	0.00	0.00
Total Mode of Instruc. tion	1:1	5.92	6.85	4.54	5.52
	Small Gp.	5.12	5.41	3.96	4.37
	Class Size	12.57	11.29	7.80	7.79
	Large Gp.	0.59	0.18	1.06	0.50
	Other	0.00	0.13	0.00	0.13
Total Curricular Areas	Reading	5.93	5.97	2.21	3.06
	Language Arts	4.28	4.04	2.09	2.20
	Math	5.79	5.00	3.18	2.15
	Science	2.20	2.94	1.81	3.71
	Social Studies	3.20	3.01	2.07	2.38
	Other	2.80	2.76	3.72	3.38
Total Noninstruc. Hours		20.33	18.30	7.75	8.00
A. Supervision		1.19	1.20	1.27	1.42
B. Planning		6.61	6.16	5.21	4.70
C. Testing		3.26	3.05	2.99	3.10
D. Record Keeping		3.07	2.70	2.23	2.42
E. Inservice		0.67	0.76	0.75	1.16
F. Clerical		4.03	3.51	3.36	3.52
G. Administrative		0.64	0.31	1.20	0.64
H. Other		0.82	0.63	1.53	1.18

* IGE Unit Leaders N = 29
IGE Teachers N = 94

The time allocation data for principals is presented in Tables 8 and 9. Table 8 provides a description of the way principals in IGE schools reported they allocated their time. The table provides means and standard deviations for the IGE schools according to the time allocation categories. The IGE principals devoted only a very small portion of their time to direct instruction of pupils. Based on reports from 28 IGE principals, they spent about 50 minutes per week teaching pupils. The IGE principal's teaching time generally was spent in teaching reading.

The IGE school principals reported spending an average of 44.17 hours per week in non-instructional activities. Administrative tasks occupied nearly 50 percent of the time of the principals. Supervision accounted for 8 percent, planning 6 percent, inservice activity 8 percent, and other tasks took 17 percent of the principals' time.

Differences in the way in which the principals in the matched pairs of IGE and non-IGE schools allocated their time were compared. The t-test values for the differences in means of time allocation categories for principals are reported in Table 9. The table presents the means for the IGE and non-IGE schools, the t-test values, and the probability of the differences in the time allocation categories. Neither the IGE school principals nor the non-IGE school principals spent much time in the direct instruction of pupils and the difference was not statistically significant.

The mean number of hours per week spent in non-instructional activities was 42.60 for the principals in IGE schools and 46.70 for the principals in non-IGE schools. Based on the data obtained from

TABLE 8

TIME ALLOCATION OF PRINCIPALS IN IGE SCHOOLS
N = 28

		Mean	Standard Deviation
Total Instruc. Hours		.84	2.63
Reading	1:1	.11	0.57
	Small Gp.	.18	0.94
	Class Size	.36	0.19
	Large Gp.	.00	0.00
	Other	.00	0.00
Language Arts	1:1	.00	0.00
	Small Gp.	.00	0.00
	Class Size	.02	0.09
	Large Gp.	.02	0.10
	Other	.00	0.00
Math	1:1	.14	0.76
	Small Gp.	.00	0.00
	Class Size	.04	0.19
	Large Gp.	.00	0.00
	Other	.00	0.00
Science	1:1	.04	0.19
	Small Gp.	.00	0.00
	Class Size	.00	0.00
	Large Gp.	.00	0.00
	Other	.00	0.00
Social Studies	1:1	.04	0.19
	Small Gp.	.00	0.00
	Class Size	.02	0.09
	Large Gp.	.00	0.00
	Other	.00	0.00
Other	1:1	.00	0.00
	Small Gp.	.00	0.00
	Class Size	.18	0.94
	Large Gp.	.04	0.19
	Other	.00	0.00
Total Mode of Instruc. tion	1:1	.32	1.70
	Small Gp.	.18	0.94
	Class Size	.29	1.08
	Large Gp.	.05	0.21
	Other	.00	0.00
Total Curricular Areas	Reading	.32	1.09
	Language Arts	.04	0.13
	Math	.18	0.77
	Science	.04	0.19
	Social Studies	.05	0.21
	Other	.21	0.96
Total Noninstruc. Hours		44.17	6.04
A. Supervision		3.72	3.59
B. Planning		2.91	3.53
C. Testing		1.60	2.33
D. Record Keeping		0.85	1.79
E. Inservice		3.74	3.13
F. Clerical		1.55	5.94
G. Administrative		21.78	12.20
H. Other		7.83	8.76

TABLE 9

T-TEST VALUES FOR TIME ALLOCATION CATEGORIES FOR PRINCIPALS
IN MATCHED IGE AND NON-IGE SCHOOLS
N = 10

		Means		T-Test	
		IGE	Non-IGE	Values	Probability
Total Instruc. Hours		1.05	0.40	0.60	.56
Reading	1:1	0.00	0.00	-	-
	Small Gp.	0.50	0.20	0.54	.60
	Class Size	0.00	0.00	-	-
	Large Gp.	0.00	0.00	-	-
	Other	0.00	0.00	-	-
Language Arts	1:1	0.00	0.00	-	-
	Small Gp.	0.00	0.00	-	-
	Class Size	0.00	0.00	-	-
	Large Gp.	0.05	0.00	1.00	.34
	Other	0.00	0.00	-	-
Math	1:1	0.00	0.00	-	-
	Small Gp.	0.00	0.00	-	-
	Class Size	0.00	0.00	-	-
	Large Gp.	0.00	0.00	-	-
	Other	0.00	0.00	-	-
Science	1:1	0.00	0.00	-	-
	Small Gp.	0.00	0.00	-	-
	Class Size	0.00	0.00	-	-
	Large Gp.	0.00	0.00	-	-
	Other	0.00	0.00	-	-
Social Studies	1:1	0.00	0.00	-	-
	Small Gp.	0.00	0.00	-	-
	Class Size	0.00	0.00	-	-
	Large Gp.	0.00	0.00	-	-
	Other	0.00	0.00	-	-
Other	1:1	0.00	0.00	-	-
	Small Gp.	0.00	0.00	-	-
	Class Size	0.00	0.00	-	-
	Large Gp.	0.50	1.00	0.11	.97
	Other	0.00	0.00	-	-
Total Mode of Instruc. tion	1:1	0.00	0.00	-	-
	Small Gp.	0.50	0.20	0.54	.60
	Class Size	0.50	1.00	0.43	.68
	Large Gp.	0.05	0.00	1.00	.34
	Other	0.00	0.00	-	-
Total Curricu- lar Areas	Reading	0.50	0.20	0.54	.60
	Language Arts	0.05	0.00	1.00	.34
	Math	0.00	0.00	-	-
	Science	0.00	0.00	-	-
	Social Studies	0.00	0.00	-	-
	Other	0.00	0.00	-	-
Total Noninstruc. Hours		42.60	46.70	-2.04	.07
A. Supervision		4.20	4.07	0.13	.90
B. Planning		2.60	5.40	-0.86	.41
C. Testing		1.10	1.65	-0.75	.47
D. Record Keeping		0.20	1.35	-2.10	.07
E. Inservice		4.35	2.25	1.46	.18
F. Clerical		0.20	1.07	-1.12	.29
G. Administrative		19.60	24.57	-1.00	.34
H. Other		9.83	6.32	0.80	.44

these 10 matched pairs, the t-test value was -2.04 and the probability was .07. The non-IGE principals devoted about four hours more per week to non-instructional activities than did IGE principals. The difference between the means approached statistical significance at the .05 level. The IGE and non-IGE principals devoted about the same amount of time to supervision and testing. Non-IGE principals devoted more time than did IGE principals to planning, record keeping, clerical tasks, and administrative tasks. IGE school principals, on the other hand, devoted more time to inservice activities and other activities than did the principals of the non-IGE schools.

IV

SUMMARY AND CONCLUSIONS

In this section we briefly summarize the study as presented in the first three sections. The findings and conclusions of the study are reviewed and the implications of the research are discussed.

Summary

This study examined the cost implications of implementing and operating the IGE/MUS-E school, and also examined how instructional personnel spend their time in IGE schools. School expenditure data and time allocation data were obtained from both IGE and non-IGE schools in order to address the following questions:

1. Do IGE schools cost more or exhibit different expenditure patterns than non-IGE schools?
2. Do instructional personnel in IGE schools allocate their time differently than instructional personnel in non-IGE schools?

Individually Guided Education (IGE) offers a major alternative to the age-graded, self-contained classroom form of schooling at the elementary level. In section I each of the seven major components of the IGE system was discussed. In addition, cost studies of IGE schools were reviewed and the relationship between the variable time and school learning was explored.

Data for the study were obtained from a stratified random sample consisting of 41 IGE schools and 15 non-IGE schools drawn from 13 states. In Section II the criteria established for participation in the study were described and selected characteristics for the 41 IGE

schools and the 15 pairs of matched IGE and non-IGE schools were presented.

The school expenditure instrument developed for use in this study was designed to obtain selected information on expenditures by a specific school within a given school district. The school expenditure form included only four major expenditure categories: (1) Instruction, (2) Operation of Plant, (3) Repairs to Plant and Equipment, and (4) Capital Outlay.

A second instrument--Time Allocation of Instructional Personnel--was developed for this study to collect data concerning the way in which instructional personnel spend their time. The respondents were asked to estimate the total amount of time, both in-school and out-of-school, that they devoted to their professional responsibilities. They were then asked to divide their total time between instructional activities and non-instructional activities. The total amount of time allocated to instructional activities was further partitioned by curricular areas and modes of instruction, and the total amount of time allocated to non-instructional activities was further partitioned into several subcategories.

Descriptive data were presented in Section III for the sample of 41 IGE schools and the 15 pairs of matched IGE and non-IGE schools. The means, standard deviations, and number of schools reporting were computed for the various school expenditure and time allocation categories. In addition, t-tests for dependent samples were calculated to

determine if the differences between the means for the matched pairs of IGE and non-IGE schools in any of the school expenditure and time allocation categories were significant. The means, t-test values, and number of schools reporting were presented for the matched pairs.

Conclusions

After analyzing the data obtained from the 15 pairs of matched IGE and non-IGE schools, our first basic conclusion is that IGE schools do not cost more than non-IGE schools. The difference between the mean expenditures of the IGE and non-IGE schools was not statistically significant at the .05 level for any of the expenditure categories. Expenditures for salaries of instructional personnel accounted for approximately 80 percent of the total expenditures reported. While principals' salaries and teachers' salaries were somewhat higher in IGE schools, salaries for the other certified personnel were somewhat higher in non-IGE schools.

Although salary differences for IGE and non-IGE schools were not significant, differences between the means approached statistical significance ($p \leq .07$) for four of the expenditure categories: (1) instructional supplies, (2) other supplies, (3) textbooks, and (4) total capital outlay. The IGE schools sampled spent more for instructional supplies and other supplies but less for textbooks than did the non-IGE schools sampled. The difference in the capital outlay category could not be interpreted with accuracy because a few large, non-recurring expenditures were reported. While costs appeared to be comparable for both IGE and non-IGE schools, their expenditure patterns varied somewhat.

Based on the time allocation data reported by instructional personnel in the 15 pairs of matched schools, our second basic conclusion is that teachers in IGE schools do spend their time differently than their counterparts in non-IGE schools. Teachers in IGE schools reported devoting more time to their jobs (45 hours/week) than teachers in non-IGE schools (40.5 hours/week). The IGE teachers allocated about two hours more per week to direct instruction of pupils and about two and one-half hours more per week to non-instructional activities than did the non-IGE teachers.

While the differences between the means of the two groups for both total instructional hours and total non-instructional hours were not significant, the allocations of time to several of the subcategories were statistically significant at the .05 level: (1) reading on a 1:1 basis, (2) math on a 1:1 basis, (3) math on a large group basis, (4) other curricular areas on a 1:1 basis, (5) total instruction on a 1:1 basis, (6) total instruction on a large group basis, and (7) non-instructional other. IGE teachers devoted significantly more time to 1:1 instruction, especially in reading and mathematics, and significantly less time to large group instruction than did the non-IGE teachers.

The time allocation data for the principals disclosed that neither the IGE school principals nor the non-IGE school principals spent much time in the direct instruction of pupils and the difference was not significant. Principals in IGE schools reported spending less time on non-instructional activities (about 42.6 hours/week) than did principals in non-IGE schools (46.7 hours/week). While none of the t-tests were significant for any of the categories of non-instructional activities,

the 4.1 hour difference between the groups for total time allocated to the non-instructional category approached statistical significance at the .05 level ($p = .07$).

Our two basic conclusions, of course, are limited to the population of IGE and non-IGE schools from which the sample was drawn. In addition, the conclusions are further limited by the use of self-report instruments and acceptance of the assumptions underlying the statistical procedures applied to the data obtained. For example, we accepted the reported times on the time allocation instruments as accurate; we did not question the respondents or actually observe them performing their various instructional and non-instructional activities. Likewise, while the IGE schools represented a random sample, the non-IGE schools were selected to match the randomly selected IGE schools.

Implications

If we can assume that a relationship exists between student achievement and the amount of time a teacher spends in instructional activities, or the amount of time a student is actually exposed to instruction, we can then assume that IGE schools are creating a more favorable learning environment than non-IGE schools. While expenditure levels were similar, teachers in IGE schools appeared to spend more time actually teaching than did teachers in non-IGE schools. In addition, teachers in IGE schools spent considerably more time in 1:1 and small group modes of instruction than did teachers in non-IGE schools.

While the study should be replicated with a larger sample, and the data instruments could be further refined, further research

investigating achievement outcomes in both IGE and non-IGE schools is needed. In particular, we need longitudinal studies which examine cost, time, and achievement in IGE and non-IGE schools. An educational innovation such as IGE may have a significant impact on the affective and cognitive behavior of students, but changes in student performance may be gradual and cumulative and may not be observable for some years.

Bibliography

Bloom, Benjamin S. "Time and Learning." American Psychologist, (September, 1974).

Boardman, R. G., and C. C. Hudson. Development of a Cost Analysis Model Which Schools May Use to Determine Budget Needs for Implementing Individually Guided Education (IGE). Lincoln, Nebraska: Teachers College, University of Nebraska, 1973.

Bocain, Barbara H. Effectiveness of the Multiunit Elementary School's Instruction and Research Unit and Student Affective Behavior in IGE Schools. Technical Report No. 389. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1976.

Carroll, J. B. "A Model of School Learning." Teachers College Record, (May, 1963).

Evers, Nancy A. IGE/MUS-E First Year Implementation Cost Survey. Technical Report No. 256. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1973.

Katzenmeyer, C., and Linda Ingison. Evaluating IGE: An Initial Literature Review and Exploratory Study. Technical Report forthcoming. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1977.

Klausmeier, Herbert J., et al. Individually Guided Education and the Multiunit Elementary School: Guidelines for Implementation. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1971.

Reason, Paul L., and Alpheus L. White. Financial Accounting for Local and State School Systems. Washington, D. C.: U. S. Government Printing Office, 1957.

Rossmiller, Richard A., and Terry G. Geske. Economic Analysis of Education: A Conceptual Framework. Theoretical Paper forthcoming. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1977.

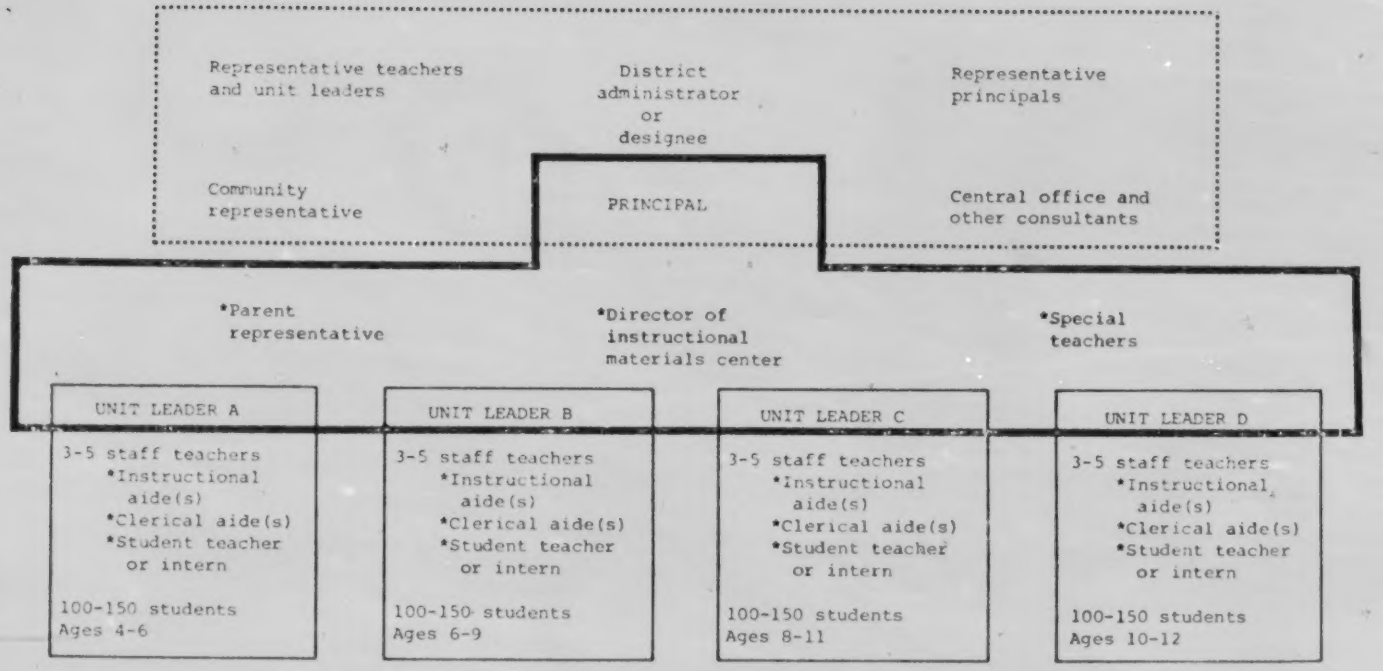
Rossmiller, Richard A., and Terry G. Geske. "Toward More Effective Use of School Resources." Journal of Education Finance, (Spring, 1976).

Sigurdson, Conrad W. Effectiveness of the Instruction and Research Unit and Student Achievement in IGE Schools. Technical Report No. 385. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1976.

Wiley, David E., and Annegret Harnischfeger. "Explosion of a Myth: Quantity of Schooling and Exposure to Instruction, Major Educational Vehicles." Educational Researcher, (April, 1974).

APPENDIX A

ORGANIZATIONAL STRUCTURE OF THE MULTIUNIT SCHOOL

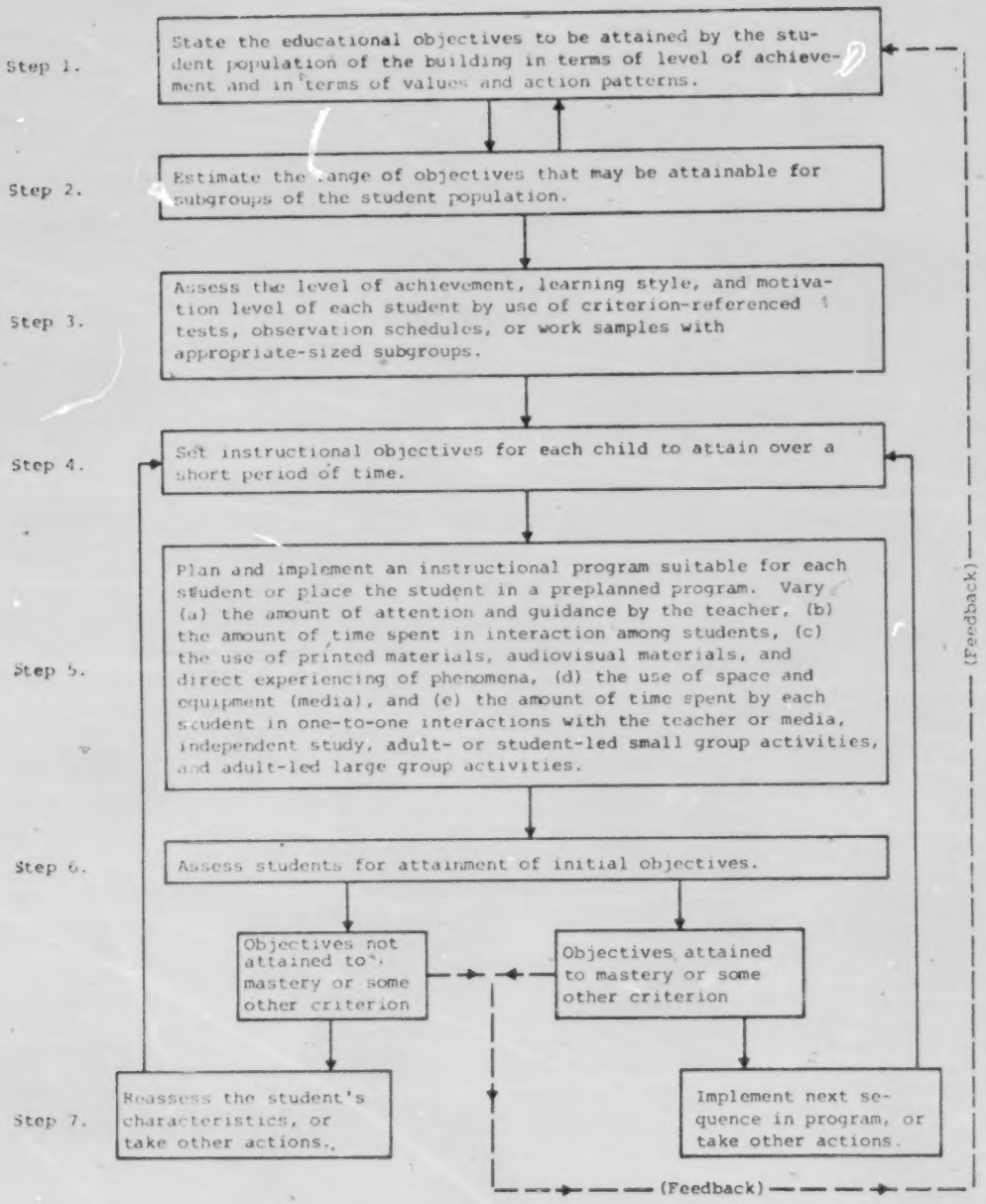


Adapted from: Herbert J. Klausmeier, Richard C. Morrow, and James E. Walter, Individually Guided Education in the Multiunit School. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1968.

57A

APPENDIX B

INSTRUCTIONAL PROGRAMMING MODEL


Step 1.
State the educational objectives to be attained by the student population of the building in terms of level of achievement and in terms of values and action patterns.
Step 2.
Estimate the range of objectives that may be attainable for subgroups of the student population.
Step 3.
Assess the level of achievement, learning style, and motivation level of each student by use of criterion-referenced tests, observation schedules, or work samples with appropriate-sized subgroups.
Step 4.
Set instructional objectives for each child to attain over a short period of time.
Step 5.
Plan and implement an instructional program suitable for each student or place the student in a preplanned program. Vary (a) the amount of attention and guidance by the teacher, (b) the amount of time spent in interaction among students, (c) the use of printed materials, audiovisual materials, and direct experiencing of phenomena, (d) the use of space and equipment (media), and (e) the amount of time spent by each student in one-to-one interactions with the teacher or media, independent study, adult- or student-led small group activities, and adult-led large group activities.
Step 6.
Assess students for attainment of initial objectives.
Objectives not attained to mastery or some other criterion
Objectives attained to mastery or some other criterion
Step 7.
Reassess the student's characteristics, or take other actions.
Implement next sequence in program, or take other actions.
(Feedback)
(Feedback)

Adapted from: Herbert J. Klausmeier, et al. Individually Guided Education and the Multiunit Elementary School: Guidelines for Implementation. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1971.

APPENDIX C

TELEPHONE SURVEY FORM

CODE: C = Cities, 200,000 +
O = Others (Under 200,000)
1st # = Random Order
2nd # = Directory Number

CHECK APPROPRIATE BOX(ES):

☐ Yes, _____

☐ Maybe, _____

☐ No, _____

☐ Call back, _____

61

TELEPHONE SURVEY

Name of School: _____

Location: _____

Phone: _____

Person Contacted: _____

Researcher: _____

Date: _____

Follow up letter sent on:

_____

_____

_____

Confirmation call back:

_____

_____

Inconvenient time for visitation:

_____

_____

Comments:

62

52

Telephone Interview to Identify 40 Schools
as Subjects for the "R-3 Correlational Studies"
and the "Evaluation of IGE vs. Non-IGE Study"

Comments

1a. Do you still consider your school an IGE school?

a) Yes

b) We're working on it

*** c) No. Would you mind telling us why not? _____

_____

1b. How many students are in your school? _____

We'd like to ask about your school's organization:

2. What grade level equivalents are included in your school? _____

*** (Stop if the school doesn't include at least two of Grades 4, 5, & 6).

3a. Is your school organized into units, teams, or learning communities?

a) Yes (this response includes "partially," "some," or "all" answers)

*** b) No (no units at all)

3b. How many units (learning communities) are in your school? _____

*** Stop conversation with a statement of appreciation.

3c. Describe the unit (learning community) structure (excluding student teachers, interns, and aides). For each unit (learning community) give:

	1	2	3	4	5	6	7	8
Unit Name								
Number of teachers assigned to the unit full time (including unit leader)								
Number of pupils (as exact as you can give it)								
*** Grade level equivalents (Stop if units are not multi-aged)								
Does the unit staff meet at least once weekly?	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N

COMMENTS:

Comments

3d. Does this description account for all pupils in the school?

a) Yes

b) No. If no, explain who isn't included in these units:

_____

1) kindergarten
2) special education pupils
*** 3) other "regular" pupils (i.e., not special education)

4a. Do you have unit leaders (or learning community leaders) assigned for a year or more to each unit (learning community)?

a) Yes, for each unit (learning community)

b) Yes, for some units (learning communities); not for others

*** c) No, none at all

4b. Does your school have an Instructional Improvement Committee (IIC) or a Program Improvement Council (PIC)?

a) Yes

b) No

c) Don't know; if c is chosen, ask:

Do you meet regularly with the unit leaders (learning community leaders)?

1) Yes

*** 2) No

4c. If yes, how many people are the regular members of this group? _____

55

Comments

4d. Does this include the principal and all unit leaders (learning community leaders)?

a) Yes

*** b) No

4e. How often does the IIC (or PIC) meet? _____

*** a) once a semester
*** b) once a month
c) twice a month (every two weeks)
d) once a week

5. Do you participate in activities with other IGE schools at least once a year? These could be schools within your district (such as in a Systemwide Program Committee [SPC]) or schools outside your district (such as a League, Network, PACT, or HUB).

a) Yes

*** b) No

Now I'd like information about your school's instructional program in reading, and math. First, we'll talk about reading. Generally, we're looking for a sequence in which your teachers identify reading objectives for the students in their unit, preassess for those objectives, then group students according to which objectives they need to master, instruct on those objectives, then test again, and regroup.

6a. Have you done this entire process for reading in your whole school?

a) Yes

*** b) No, explain which students are excluded _____

_____

Comments

6b. Have you done it for two years or more (at least since October, 1973)?

a) Yes

*** b) No

(Refer to Organizational chart, and say "As you know we are interested in collecting data in one intermediate unit. I'd like more specific information about units _____, _____, and _____." (the intermediate units)

7a. Are any of the unit leaders in these intermediate units new to their units as of this September ('75)?

a) Yes, in unit(s) _____, _____, _____, (discount those units)

b) No

7b. In any of these (remaining) units are more than half of the teachers new to the unit this September?

a) Yes, in unit(s) _____, _____, _____.

b) No

In any of these (remaining intermediate) units, we are looking for that same instruction sequence in relation to mathematics. That is, math objectives are set for the students in the unit, there is preassessment, grouping for instruction, postassessment, and regrouping.

Comments

7c. Have these units done this entire process in math for at least one year? (i.e., since September, '74)

a) Yes, in all units

b) No, only in units _____, and _____

*** c) No, not in any units

7d. Have the majority of students in this (these) unit(s) had this instructional sequence in math last year? (either in the unit they are presently in or in another unit?) Explain.

a) Yes, for unit(s) _____

*** b) No

If more than one intermediate unit is left, randomly choose intermediate unit for study, and solicit participation of the randomly selected unit. If they seem at all interested, ask:

8. Are there non-IGE schools in your district?

a) Yes, is so approximately how many? _____

b) No

c) I don't know

APPENDIX D

SCHOOL EXPENDITURE DATA INSTRUMENT

SCHOOL EXPENDITURE DATA

Directions:

1. This form may be completed by:

   The school principal if accounting data for the school are available in the principal's office

   or by

   The school district's superintendent or business manager if accounting data for each school are available only in the district's central office.

2. The expenditure categories for which data are requested are those found in Financial Accounting for Local and State School Systems (Handbook II in the State Educational Records and Reports Series published by the U.S. Office of Education).

3. Attached to this form are descriptions and definitions of the various expenditure categories.

4. We realize that not all school districts maintain complete financial records on a school-by-school basis. For this reason we are requesting data only for expenditure categories that are most likely to be maintained at the school level. It is hoped that the school or school district will be able to provide reasonably accurate information on the expenditures in these categories for the school.

5. The expenditure data requested are for the 1974-75 school year.

6. If questions should arise concerning the completion of this form, please do not hesitate to call collect Terry Geske at 608/263-4270 or Richard Rossmiller at 608/263-4200.

	Total School
I. Instruction	
A. Salaries	
Principal(s)	_____
Teachers	_____
Other certificated professional staff	_____
Secretarial and clerical	_____
Other salaries	_____

	Total School
B. Supplies and Materials	
Instructional supplies and materials	_____
Other supplies and materials	_____
C. Textbooks, Library and Audiovisual	
Textbooks	_____
Library books	_____
Periodicals and newspapers	_____
Audiovisual materials	_____
Other	_____
D. Other Expenses	
Travel	_____
Expenses of inservice education	_____
Other expenses	_____
II. Operation of Plant	
A. Salaries	
Plant engineers	_____
Custodians	_____
B. Supplies and Materials	_____
C. Utilities	_____
D. Other Expenses	_____
III. Repairs to Plant and Equipment	_____
IV. Capital Outlay	
Replacement of instructional equipment	_____
Addition to instructional equipment	_____

V. General Information:

1. Please indicate the average salary paid the following categories of district employees during the 1974-75 school year.

   Elementary school (Grades K-6) teachers _____

   Elementary school principals _____

   Instructional aides _____

   Secretarial and/or clerical personnel _____

2. Fringe benefits represent a significant expenditure item in most school districts. Please estimate as accurately as possible the average cost to the district of the fringe benefits (restaurant, social security, health insurance, life insurance, etc.) provided for the typical employee in each of the following categories during the 1974-75 school year.

   Elementary school (Grades K-6) teachers _____

   Elementary school principals _____

   Instructional aides _____

   Secretarial and/or clerical personnel _____

3. If the district has multiunit IGE schools, please indicate the average amount of additional compensation, if any, that a unit leader receives.

   _____

4. School districts sometimes establish guidelines for allocating funds for instructional supplies amd materials, textbooks, library books, etc. If your district has such a policy, please indicate the amount allocated per pupil, per teacher, or per school for supplies, materials, etc. or indicate the basis on which such allocations are made.

   _____

   _____

   _____

   _____

   _____

Definition of Expenditure Categories

Following are specific definitions which should help clarify the costs to be included within each expenditure category:

I. Instruction

Instruction consists of those activities dealing directly with or aiding in the teaching of students or improving the quality of instruction. Examples are the activities of teachers, principals, consultants, or supervisors of instruction, and guidance and psychological personnel.

A. Salaries

Principals - The full-time, part-time, and prorated portions of salaries of principals, assistant principals, and other personnel performing the administrative duties of a principal. Salaries of principals who teach classes are prorated to this account in proportion to the time devoted to the coordination and supervision of the activities of the schools.

Teachers - The full-time, part-time and prorated portions of salaries for all teaching services rendered to pupils in the public schools, including the salaries of substitute teachers.

Other Certificated Instructional Staff - The full-time, part-time and prorated portion of salaries for services rendered by school librarians, television instructional personnel, audiovisual personnel, guidance personnel, psychologists and psychometrists.

Secretarial and Clerical - The full-time, part-time and prorated portions of salaries for secretarial and clerical assistants to instructional personnel.

Other Salaries - The full-time, part-time and prorated portions of salaries for any non-certificated assistants or aides to instructional staff other than secretarial and clerical personnel, such as lay readers, study hall teachers, theme graders, etc.

B. Supplies and Materials

Instructional - Expenditures for all supplies and materials which are actually or constructively consumed in the instructional program, including the freight and cartage costs, are recorded here.

Examples of such supplies include chalk, paper, test tubes, ink, pencils, paint brushes, paints, chemicals, shop supplies for vocational courses, oils, cleaners, music supplies, supplies for operation of equipment used in instructional programs (typewriter ribbons, etc.), workbooks, physical education supplies, printing of classroom materials, periodicals for classroom use (not library).

Other Supplies and Materials - Expenditures for all supplies used by teachers other than those actually used in the instructional program are recorded here. Examples of such expenditures include stationery, postage, desk supplies, etc.

C. Textbooks, Library and Audiovisual

Textbooks - Expenditures for replacement of textbooks furnished free to all public school pupils, bindings and other textbook repairs, and freight and cartage of textbooks. Purchase of textbooks rented to the students are also included here.

Library Books - Expenditures for regular or incidental purchases of school library books available for general use by students. Other expenditures included in this account are costs of binding, other book repairs, and shipping charges for school library books.

Periodicals and Newspapers - Expenditures for periodicals and newspapers for general use by the school library. (A periodical is any publication appearing at regular intervals of less than a year and continuing for an indefinite period.)

Audiovisual Materials - Expenditures for audiovisual materials (not equipment) used in the instructional programs, such as films, filmstrips, recordings, exhibits, charts, maps, and television and radio materials, including the rental of such materials.

Other Expenses - Expenditures for library services in lieu of maintaining a school library and for school library supplies such as paper, pencils, index cards, and other office supplies.

D. Other Expenses

Travel - Expenditures for the travel of all instructional personnel and their assistants, including travel in connection with the everyday instructional activities and travel to conventions, meetings, institutes, and workshops. This includes meals, lodging, registration fees, etc.

Expenses of Inservice Education - Expenses of workshops, professional libraries, convention expenses, reimbursement of expenses for attending summer school and extension courses, etc.

Other Expenses - Miscellaneous expenditures incurred for the instructional program for such things as graduation expenses, assembly speakers, field trips, etc.

II. Operation of Plant

Operation of plant consists of the housekeeping activities concerned with keeping the physical plant open and ready for use. It includes cleaning, disinfecting, laundering, dry cleaning, heating, lighting, communications, power, moving furniture, handling stores, caring for grounds, and other housekeeping activities that are repeated somewhat regularly on a daily, weekly, monthly, or seasonal basis. Operation of plant does not encompass the repair and replacement of facilities and equipment.

A. Salaries

Plant Engineers - The full-time, part-time, and prorated portions of salaries of personnel responsible for supervising the staff servicing buildings.

Custodians - The full-time, part-time, and prorated portions of salaries of custodians, firemen, custodians' helpers, matrons, general utility men, night watchmen, and other such personnel who sweep, clean, polish, mop, care for grounds, operate the heating and ventilating systems, and perform any other housekeeping duties. Salaries of custodians performing maintenance activities during vacation periods should be prorated between this account and Maintenance of Plant.

B. Supplies and Materials

Expenditures for brooms, mops, soap, dusters, electrical fuses, electric light bulbs, fluorescent tubes, paper towels, hand towels, floor wax, bath towels, paper cups, toilet paper, and other such consumable custodial supplies.

C. Utilities

Heat for Buildings - Expenditures for all coal, steam, electricity, gas, gasoline, fuel oil, and wood used for heating, including transportation costs involved. If electricity and gas are used for heating and other purposes and if the bills cannot be divided between heat and other utilities, the expenditure should be recorded under this account.

Gas (Not Heat) - All expenditures for gas for any use other than heating buildings should be recorded here.

Water and Sewage - Expenditures paid to municipal governments for water and sewage service. Include cost of supplies such as chemicals for water or sewer treatment when the school district maintains its own water and sewer system.

Electricity - All expenditures for electricity except electricity used for heating buildings should be recorded here.

Telephone and Telegraph - Expenditures for telephone and telegraph, including rental of the telephone switchboards are recorded here.

D. Other Expenses

Reimbursement of expenses for travel by plant operation personnel in the performance of their jobs and in attending workshops, etc. Meals, lodging, registration fees, etc., are also recorded here.

III. Repairs to Plant and Equipment

Plant maintenance consists of those activities that are concerned with keeping the grounds, buildings, service systems, furniture and equipment in good repair. Repairs to capital items consist of expenditures for contracted services, salaries, and wages of school employees engaged for that purpose, materials, and supplies used in the repair of existing buildings, grounds, service systems, furniture and other equipment. Expenditures which add to existing furniture and equipment inventories and/or include replacements of equipment, major integral units of buildings or mechanical systems and expenditures for site improvement replacements, are not recorded under the Capital Outlay accounts, if they are not a part of a building construction, major remodeling or site improvement project.

The following general guide is suggested for the allocation of expenditures for maintenance of buildings and service systems: Expenditures which are incurred to repair existing partitions walls, ceilings, roof structures, ducts, vents, windows, light fixtures, boilers, etc., which do not result in changes in these kinds of intergral units of the buildings, service systems, and the integral unit has not been totally replaced, the expenditure shall be recorded as maintenance. If an integral unit has been replaced in its entirety, and is not a part of a remodeling project, the expenditure ordinarily will be recorded in the Capital Outlay account.

IV. Capital Outlay

Capital Outlay expenditures are those which result in the acquisition of new fixed assets or additions or improvements to existing fixed assets.

Instructional Equipment - Expenditures to furnish and equip a newly constructed or remodeled building for instruction are recorded here. Instructional equipment is that used by pupils, teachers, principals and supervisors of instruction in the instructional program and is not a built-in item. Some examples of instructional equipment are: desks, workbenches, shop machinery and tools, musical instruments, typewriters, business machines, phonographs, radios, motion picture projectors, sewing machines, science laboratory apparatus, encyclopedia sets, unabridged dictionaries, physical education appartus, and other equipment used in the instructional program.

APPENDIX E

TIME ALLOCATION OF INSTRUCTIONAL PERSONNEL INSTRUMENT

TIME ALLOCATION OF INSTRUCTIONAL PERSONNEL

Instructions:

1. This form is designed to provide information about the utilization of time by staff members in I & R units. The form should be completed by each staff member of the I & R Unit and by the principal.

2. Please estimate as accurately as you can either:

   a) the number of hours per week you typically spend in the various activities listed on this form

   or

   b) the percentage of time per week you typically spend in the various activities listed on this form.

3. If you report your allocation of time in hours, the total of the hours in Category II--Direct Instruction of Pupils, and Category III--Activities Other Than Direct Instruction of Pupils, should equal the total amount of time, both in-school and out-of-school, that you devote to your job.

   If you report your time in percentage, the percentage of time in Category II--Direct Instruction of Pupils, and Category III--Activities Other Than Direct Instruction of Pupils, should total to 100%.

4. If you are not involved in a particular activity enter a zero (0).

5. If you are not directly involved in instruction of students, e.g., principal or secretary, you may disregard Section II of the form.

6. If you are directly involved in instruction of students, we are especially interested in the amount or percentage of time devoted to the various modes of instruction (for example, one-to-one, small group, large group, etc.) in the various areas of the curriculum. Your best estimate of the amount or percentage of your time spent in these various activities is sufficient; we do not expect "stop watch" accuracy in your estimates.

I. Please check your position.

_____ Principal	_____ Aide
_____ Unit leader	_____ Intern
_____ Unit teacher	_____ Unit secretary

II. Direct Instruction of Pupils

Direct instruction of students includes those activities in which you are directly involved in teaching students. Examples would include lecturing to a large group of students, showing a film, working with a small group of students on a particular skill, or working with an individual student in a task or giving directions to a student who will engage in independent study.

A. Please estimate the number of hours per week or percentage of time per week that you spend in this activity:

_____

B. Of the time you spend in direct instruction of students, please indicate how that time is allocated among the following curricular areas and modes of instruction:

	Mode of Instruction			
Curriculum Area	Independent Study or one-to-one	Small Group (3-5 students)	Class-size Group (25-35 students)	Large Group (75-150 students)
Reading				
Language Arts				
Mathematics				
Science				
Social Studies				
Other				

III. Activities Other Than Direct Instruction of Pupils

No. of Hours/Week or Percentage of Time in This Activity

A. Supervision of Pupils, e.g., recess, lunchroom, playground, etc. _____

B. Planning, e.g., instructional activities for pupils, activities of the entire unit, etc. _____

C. Testing/Assessing/Evaluating, e.g., activities associated with determining progress of pupils relative to established objectives. _____

No. of Hours/Week or Percentage of Time in This Activity

D. Record Keeping, e.g., maintaining up-to-date records on each pupil's progress toward established objectives. _____

E. Inservice Training, e.g., schoolwide or system-wide activities designed to promote professional development of the staff. _____

F. Clerical/secretarial, e.g., typing tests and instructional materials, correcting papers and tests, mimeographing or duplicating materials, and similar activities. _____

G. Administrative, e g., activities such as supervision of instruction which support the instructional program but are not directly involved with it.

H. Other, any activities not identified in the above categories (please specify). _____

_____

_____

_____

_____

APPENDIX F

GENERAL INFORMATION LETTER

the
Wisconsin
Research and Development Center
for Cognitive
Learning

the University of Wisconsin · 1025 West Johnson Street · Madison, Wisconsin 53706 · (608)262 - 4901

1975-76

R-3 Research Project

General Information

1. This is a national study involving 40 IGE schools. One intermediate unit/team from each school will be participating. Each school and each unit have been chosen randomly.

2. One or two researchers from the R and D Center will be visiting the intermediate unit/team during one school day to collect data during the month of January or February.

3. The principal and the selected team members will receive indepth questionnaires in advance of the school visits. A packet with instruments and instructions for the principal, team leader, and teachers will be sent to the school prior to the visitation. The instruments need not be filled out in one sitting. You will have a period of at least 2 weeks to complete them. Contained in this packet will be the following instruments:

   a. Principal Instruments (Total Time [#1 & 2] 25-30 minutes)

      1) Background Information and Organizational Structure Survey (Form P)
      The purpose of this instrument is to obtain background data and to determine the nature of the organizational structure in IGE schools. It requires approximately 30 minutes to complete.

      2) Time Allocation of Instructional Personnel
      The purpose of this instrument is to obtain information about the utilization of time by staff members in I & R units. It requires approximately 15 minutes to complete.

      3) School Expenditure Data Form
      The purpose of this instrument is to provide information about the major direct and indirect costs involved in the operation of an IGE school.

b. Unit Leader Instruments (Total Time 1 1/2-2 hours)

1) Background Information and Organizational Structure Survey (Form UL)
The purpose of this instrument is to obtain background data and to determine the nature of the organizational structure in IGE schools. It requires approximately 20 minutes to complete.

2) Decision Involvement Analysis
The purpose of this instrument is to determine the nature of involvement in the decision-making process in IGE schools. It requires approximately 15 minutes to complete.

3) Principal Leadership Assessment
The purpose of this instrument is to determine the nature of the principal's leadership style. It requires approximately 10 minutes to complete.

4) Job Satisfaction Survey
The purpose of this instrument is to determine the extent of satisfaction with various aspects of the job in IGE schools. It requires approximately 30 minutes to complete.

5) Time Allocation of Instructional Personnel
The purpose of this instrument is to obtain information about the utilization of time by staff members in I & R units. It requires approximately 15 minutes to complete.

6) Unit/Team Operations Questionnaire (Effectiveness Measure)
The purpose of this instrument is to investigate the degree (as perceived by the teachers) to which the team/unit accomplishes particular tasks which have been identified as belonging to the teaching team/unit. It requires approximately 30 minutes to complete.

c. Unit Teacher Instruments (Total Time 2-2 1/2 hours)

1) Background Information and Organizational Structure Survey (Form T)
The purpose of this instrument is to obtain background data and to determine the nature of the organizational structure in IGE schools. It requires approximately 20 minutes to complete.

2) [illegible]ion Involvement Analysis
The purpose of this instrument is to determine the nature of involvement in the decision-making process in IGE schools. It requires approximately 15 minutes to complete.

3) Unit Leader Leadership Assessment
The purpose of this instrument is to determine the nature of the unit leader's leadership style. It requires approximately 10 minutes to complete.

4) Principal Leadership Assessment
The purpose of this instrument is to determine the nature of the principal's leadership style. It requires approximately 10 minutes to complete.

5) Job Satisfaction Survey
The purpose of this instrument is to determine the extent of satisfaction with various aspects of the job in IGE schools. It requires approximately 30 minutes to complete.

6) Time Allocation of Instructional Personnel
The purpose of this instrument is to obtain information about the utilization of time by staff members in I & R units. It requires approximately 15 minutes to complete.

7) Unit/Team Operations Questionnaire (Effectiveness Measure)
The purpose of this instrument is to investigate the degree (as perceived by the teachers) to which the team/unit accomplishes particular tasks which have been identified as belonging to the teaching team/unit. It requires 30 minutes to complete.

4. During the visit, the researcher(s), in cooperation with the unit teachers will administer a standardized self concept survey to one third of the students in the unit, a mathematics standardized test to the second third of the unit, and a standardized reading test to the final third of the students in the unit. Thus, no student will take more than one test. These standarized instruments are:

   a. Intermediate Self Observation Scale (SOS) California Form (C)
   This instrument takes approximately 25 minutes.

   b. California Test of Basic Skills (Reading and Mathematics)-Form S
   This instrument takes approximately 1 1/2 hours.

5. The purpose of this research is twofold:

   a. We will relate the "effectiveness" of the unit to student affective behavior and student achievement. The question that arises is: "Is there a positive correlation between team or unit effectiveness and student self concept and achievement?" We feel that in addition to being of significant value to researchers at the R & D Center, the answer to this question would be of great interest to you as you promote, develop and refine your IGE school.

b. We will be examining the factors (organizational structure and leadership) that contribute most strongly to teacher satisfaction.

6. a. We will send self concept and achievement profiles to each participating unit/team as soon as the publisher sends them to us--at no cost to the school.

b. When the entire study of 40 IGE schools is complete, we will send technical reports of the research as soon as the R & D Center makes them available--again at no cost to the school.

c. No schools or students will be identified in any reports.

7. Specific details on procedures will be sent to participating schools prior to visitation.

8. Additional R & D research, presently in the planning stage, will collect comparative school data on non-IGE schools.

R & D Research Team
Barbara Bocian
Robert Feldman
Diana Mendenhall
Conrad Sigurdson

Principal Investigators
Dr. James M. Lipham
Dr. Richard A. Rossmiller

Project Associate
Dr. Terry G. Geske

Center Planning and Policy Committee

Richard A. Rossmiller
Center Director

Wayne R. Otto
Associate Center Director and
Area Chairperson
Studies in Reading, Language
and Communication Processes

Marvin J. Fruth
Area Chairperson
Studies of Individualized
Schooling

Herbert J. Klausmeier
Area Chairperson
Studies of Cognitive
Learning and Development

James M. Lipham
Area Chairperson
Studies of Organization
for Instruction and
Administrative Arrangements

Thomas A. Romberg
Area Chairperson
Research on Learning
Processes in Mathematics
and IGE Evaluation

Associated Faculty

Vernon L. Allen
Professor
Psychology

B. Dean Bowles
Professor
Educational Administration

Thomas P. Carpenter
Assistant Professor
Curriculum and Instruction

W. Patrick Dixon
Assistant Professor
Child and Family Studies

Marvin J. Fruth
Professor
Educational Administration

John G. Harvey
Professor
Mathematics
Curriculum and Instruction

Frank H. Hooper
Professor
Child and Family Studies

Dale D. Johnson
Associate Professor
Curriculum and Instruction

Herbert J. Klausmeier
V.A.C. Henmon Professor
Educational Psychology

Joseph T. Lawton
Assistant Professor
Child and Family Studies

Joel R. Levin
Professor
Educational Psychology

James M. Lipham
Professor
Educational Administration

Dominic W. Massaro
Professor
Psychology

Donald A. McIsaac
Professor
Educational Administration

Gerald Nadler
Professor
Industrial Engineering

Wayne R. Otto
Professor
Curriculum and Instruction

Penelope L. Peterson
Assistant Professor
Educational Psychology

Robert G. Petzold
Professor
Music
Curriculum and Instruction

Thomas S. Popkewitz
Assistant Professor
Curriculum and Instruction

Gary G. Price
Assistant Professor
Curriculum and Instruction

Thomas A. Romberg
Professor
Curriculum and Instruction

Richard A. Rossmiller
Professor
Educational Administration

B. Robert Tabachnick
Professor
Curriculum and Instruction

J. Fred Weaver
Professor
Curriculum and Instruction

Gary G. Wehlage
Associate Professor
Curriculum and Instruction